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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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PEPPER HAMILTON LLP ONE MELLON CENTER, 50TH FLOOR 500 GRANT STREET PITTSBURGH, PA 15219			EXAMINER GISHNOCK, NIKOLAI A	
			ART UNIT 3714	PAPER NUMBER
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/822,426	<b>Applicant(s)</b> DEANE ET AL.	
	<b>Examiner</b> Nikolai A. Gishnock	<b>Art Unit</b> 3714	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 April 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-41 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-41 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>8/9/2004</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Oath/Declaration***

1. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

It does not state that the person making the oath or declaration acknowledges the duty to disclose to the Office all information known to the person to be material to patentability as defined in 37 CFR 1.56.

### ***Claim Rejections - 35 USC § 101***

1. 35 U.S.C. 101 reads as follows:  
  
Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.
2. Claims 1-18, 22-25, 28-30, & 34-39 are rejected under 35 U.S.C. §101 as being directed to nonstatutory subject matter. The claims fail to produce a tangible effect. The requirement to be tangible is for the claim to produce a real-world result or beneficial product. The claims fail because they merely evaluate abstract functions and do not bring about a substantial application. The limitations do not cause an output or other indication to a user that something has occurred. If the claim does not entail transformation of an article, then the claim shall be reviewed to determine that it produces a useful, tangible, and concrete result. In making this determination, the focus is not on whether the steps taken to achieve a particular result are useful, tangible, or concrete, but rather on whether the final result achieved by the claimed

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invention is useful, tangible, and concrete. If the claims are found not to have such a practical application, then the claim is determined to be nonstatutory. See MPEP 2106.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 3, 5, 6, & 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Sweitzer et al. (US 6,018,617), hereinafter known as Sweitzer. Sweitzer discloses a method and a system for automatically generating a word problem comprising a processor and computer readable storage medium operably connected to the processor (5:20-29), containing instructions for performing a method comprising: receiving a designation of a problem type from a user (9:61-63); identifying or determining one or more variables based on the problem type (values are computed for each of the variables according to the variation rules, 11:22-29); assigning at least one value to at least one variable (variables may be replaced with numbers, text, graphics, or mathematical expressions, 12:30-32); receiving, from a user, a designation of a variable for which to solve (Key \$"TOTAL" is replaced by \$0.40; Variables are available for substitution into the content sections; They take the place of the placeholders designated by the author, see Figure 5); and generating an assessment item of the problem type based on the variables (end user uses the authoring tool to write problems, including question text, answer choices, instructions, etc., 6:13-18) [Claims 1 & 19]. Sweitzer discloses wherein the problem

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type comprises a mathematical word problem (system for formatting and printing an examination having one or more mathematical expressions, 5:20-29) [Claim 3]. Sweitzer discloses wherein assigning at least one value to at least one variable comprises assigning a range of values to a variable from which a value for the variable is selected when the assessment item is generated (authoring tool is designed so that numeric and text variable selection will allow for ranges; value exclusion method, both at 10:66-11:12) [Claim 5]. Sweitzer discloses wherein assigning at least one value to at least one variable comprises assigning a variable used to determine a format for the assessment item (authoring tool allows {users to} change between answer formats without loss of information already entered, 10:46-51) [Claim 6].

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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7. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sweitzer, in view of Wen et al. (US 6,341,959 B1), hereinafter known as Wen. Sweitzer teaches all the features as demonstrated above in the rejection of claim 1. What Sweitzer fails to teach is wherein identifying one or more variables comprises identifying a language used to generate the assessment item [Claim 2]. However, Wen teaches a method and system of teaching a language, using a grammatical engine which collects the grammar of a language (such as English) to provide grammatical rules (1:55-60). This grammatical engine identifies a language used to generate an assessment item, based on the grammatical rules. Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have used the grammar database identifying a language such as English, in the word problem generator of Sweitzer, in order to teach word problems while teaching a language [Claim 2].

8. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sweitzer, in view of Erickson (US 5,902,114), hereinafter known as Erickson. Sweitzer teaches all the features as demonstrated above in the rejection of claim 1. What Sweitzer fails to teach is wherein assigning at least one value to at least one variable comprises determining a unit of measurement for a variable [Claim 4]. However, Erickson teaches a method of teaching the formulation of word problems, incorporating dimensional analysis using variables representing units (5:39-52). Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have incorporated the units of measurement as used by Erickson in the word problem generator of Sweitzer, in order to teach the methods of dimensional analysis [Claim 4]

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9. Claims 7-10, 12, 13, 20-33, & 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sweitzer, in view of Bloom et al. (US 5,597,312), hereinafter known as Bloom. Sweitzer discloses a method of automatically generating an assessment item, the method comprising: receiving one or more inputs from a user (9:61-63); generating one or more variables based on the one or more inputs (11:22-29). What Sweitzer fails to explicitly teach is determining one or more relationships between at least two of the variables; and generating an assessment item based on the one or more variables and the one or more relationships [Claims 7 & 20], and wherein the one or more relationships comprise relationships based on one or more of word order; word choice; word format; sentence structure; grammar; and language [Claim 8]. However, Bloom teaches a method and system for authoring intelligent tutoring, including an exercise function (6:4-12), using a grammar builder to define situations, actions and other grammar nodes and a sequence and condition of their execution for a tutoring conversation. The situations and actions are variables defined and linked by the user (19:48-53). Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have defined the variables of the word problem generator of Sweitzer using the grammar node relationships as taught by Bloom, in order to train a student using natural language [Claims 7, 8, & 20] Sweitzer discloses wherein the assessment item is a mathematical word problem (5:20-29) [Claim 9]. Sweitzer discloses a method of automatically generating an assessment item, the method comprising: receiving one or more inputs pertaining to the format of an assessment item, and determining a format for the assessment item (10:46-51) and selecting one or more variables for use in the assessment item (12:30-32); [Claims 10 & 21]; What Sweitzer fails to teach is wherein the format of the assessment item comprises at least one event; determining a relationship between variables assigned to each event; and generating an assessment item based on at least the format for the assessment item and the

relationship between variables assigned to the at least one event [Claims 10 & 21]. However, Bloom teaches action definitions used in the grammar builder (19:6-14), which are linked in a relationship by the author using the grammar builder (19:48-53). Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have defined the word problems generated as taught by Sweitzer, using the events and their relationships as taught by Bloom, in order to train a student using natural language [Claims 10 & 21]. Sweitzer discloses wherein determining a relationship for the variables assigned to each event comprises one or more of the following: determining a variable for which to solve for each event and determining an answer for each event (both at Figure 5); determining a value for one or more variables (12:30-32); and determining a variable format (10:46-51) [Claim 12]. Sweitzer discloses wherein determining a format for the assessment item comprises: determining a problem format having one or more sections (multiple-choice format, 10:46-53); and determining content to place within each section (the variation rules engine processes the variation rules from a {multiple-choice} problem from the top down, and each line specifies a calculation, constraint, or an external function call, 17:43-51) [Claim 13]. Sweitzer discloses a method of automatically generating an assessment item, the method comprising: receiving one or more input parameters (12:30-32); generating a document structure based on the one or more input parameters (print engine, 18:33-40; inputs are the random variables in the problems) [Claims 22 & 40]. What Sweitzer fails to teach is producing a logical schema using the document structure; and generating an assessment item based on the logical schema [Claims 22 & 40]. However, Bloom's conversations are taught to be syntactically-correct sequences of situations and actions, which form a variable path through the discourse. The mapping of conversations of Bloom represents a logical schema, having information pertaining to the syntax and vocabulary used to generate natural language. Therefore, it would have been obvious to one of ordinary skill in the



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art, at the time the invention was made, to have used the conversation generator as taught by Bloom, in the word problem generator of Sweitzer, in order to generate word problems that follow natural language [Claims 22 & 40]. What Sweitzer further fails to explicitly teach is wherein generating a document structure comprises: building a mental model; and outlining the document structure based on the mental model [Claim 23], and wherein building a mental model comprises: selecting one or more semantic frames; generating a list of one or more events; and binding one or more variables across the one or more events [Claim 24], and wherein outlining the document structure comprises: generating one or more sentences for the mental model; determining a function for each sentence; and determining information to express in each sentence [Claim 25]. However, Bloom teaches a student model (11:25-12:65), which outlines the topics taught to the student, and represents all the tasks and conversations available to the student within each topic (11:52-12:4). Thus the conversations of Bloom are generated using the student model, and the conversations used to build a document structure using the user interface (4:17-20). The mental model comprises selecting semantic frames {hierarchical patterns of vocabulary} (15:63-16:2), generating a list of events {actions}, by traversing the nodes of the conversation tree, and binding the variables across the events (application descriptions include information about input and output fields and the values expected in them, 16:9-13). Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have used the mental models as described by Bloom, in the word problem generator of Sweitzer, in order to reflect natural language in the word problem [Claims 23-25]. Sweitzer discloses storing the document structure in a file (The authoring tool stores problem descriptions in files, 9:52-53) [Claim 26]. What Sweitzer and Bloom fail to explicitly teach wherein the document structure file is an XML file [Claim 27]. However, Applicant has not disclosed that having the file be an XML file solves any stated problem or is for any particular

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purpose. Moreover, it appears that the Microsoft Word type files of Sweitzer (3:52-61) or the Applicant's instant invention would perform equally well for storing a variable document specification. Accordingly, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have modified Sweitzer and Bloom to use an XML file, because such a modification would have been considered a mere design consideration, which fails to patentably distinguish over Sweitzer and Bloom [Claim 27]. Sweitzer discloses wherein the document structure includes an outline of a sequence of one or more sentences for the assessment item (Variation rules define instances of a generalized problem, 12:25-67; also, dynamic problems are varied using sequencing and randomization, 15:48-65) [Claim 28]. Bloom teaches wherein producing a logical schema comprises: outlining a sentence structure for one or more sentences (situation-action rules map onto discourse grammar nodes, the nodes are reusable portions of conversations that can appear in different scenarios, 15:54-57); and determining an information format for each sentence (individual grammar definition, covering a syntax defining the {information} paths, 16:41-58) [Claim 29]. Bloom teaches wherein determining an information format comprises determining an ordering of one or more elements for each sentence (the situation-action nodes of grammar form a path, 15:44-62) [Claim 30]. Bloom teaches storing the logical schema in a file (each piece of multimedia is contained in separate files, 7:1-10) [Claim 31]. What Sweitzer and bloom fail to explicitly teach is wherein the logical schema file is an XML file [Claim 32]. However, Applicant has not disclosed that having the file be an XML file solves any stated problem or is for any particular purpose. Moreover, it appears that the Microsoft Word type files of Sweitzer (3:52-61) or the Applicant's instant invention would perform equally well for storing a variable document specification. Accordingly, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have modified Sweitzer and Bloom to use an XML file, because such a modification would

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have been considered a mere design consideration, which fails to patentably distinguish over Sweitzer and Bloom [Claim 32]. Bloom teaches wherein generating an assessment item comprises: parsing the logical schema (the conversation author works by selecting the part of the grammar path to be instantiated (19:60-62); annotating the parsed logical schema with grammatical information (during authoring the system and method execute the selected grammar part and present the author with a variety of different input fields depending upon the specific situation or action being executed, 19:66-20:3); determining words and word forms based on the grammatical information (In the case of verbal actions, the author would type in the correct response in the verbal action field, 20:13-15); and outputting text representing the assessment item (the saved conversation can then be edited or used by the system 20:23-29) [Claim 33].

10. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sweitzer, in view of Bloom, and further in view of Erickson. Sweitzer and Bloom teach all the features as demonstrated above in claim 10, including wherein the one or more inputs comprise one or more of: a number of events; a number of distinct frames; a type of participant in each event; and a type of assessment item to generate [Claim 11]. What Sweitzer and Bloom fail to teach is a unit of measure for each variable [Claim 11]. However, Erickson teaches a method of teaching the formulation of word problems, incorporating dimensional analysis using variables representing units (5:39-52). Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have incorporated the units of measurement as used by Erickson in the word problem generator of Sweitzer, in order to teach the methods of dimensional analysis [Claim 11].

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11. Claims 14-19 & 34-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sweitzer and Bloom, and further in view of Wen. Sweitzer and Bloom teach all the features as demonstrated above in claims 10 and 22, including wherein generating an assessment item comprises one or more of the following: selecting a sentence structure for each sentence in the assessment item; selecting identification types for one or more of the variables; determining a numerical format for each of the one or more variables; and determining a verb tense to use for each event [Claim 14]; a method of automatically generating an assessment item, the method comprising: assigning one or more mental model structure variables; defining one or more identity variables for a mental model structure; determining a task-relevant problem structure; defining a document format; and determining language variations [Claims 35 & 41], wherein assigning one or more mental model structure variables comprises defining one or more of the following: one or more events; one or more distinct semantic frames; one or more participant types; and an event type for each event [Claim 36], wherein determining a task-relevant problem structure comprises: determining a variable for which to solve for each event; determining an answer for each event; and determining one or more values for each variable [Claim 37], wherein determining language variations comprises: selecting a sentence structure for each of one or more sentences; selecting a referent identification type for each of one or more participants; and determining a tense for each of one or more events [Claim 38]. What Sweitzer and Bloom fail to teach is selecting a language for the assessment item [Claim 14]; wherein an input parameter determines a language used for the assessment item [Claim 34], and assigning a variable determining a language in which to generate the assessment item [Claim 39]. However, Wen teaches a method and system of teaching a language, using a grammatical engine which collects the grammar of a language {such as English} to provide grammatical rules (1:55-60). This grammatical engine identifies a language used to generate an

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assessment item, based on the grammatical rules. Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have used the grammar database identifying a language such as English, in the word problem generator of Sweitzer, in order to teach word problems while teaching a language [Claims 14-19 & 34-39]. What Sweitzer, Bloom, and Wen further fail to teach is wherein selecting identification types comprise determining to identify a variable denoting a person by using a proper name [Claim 15], wherein selecting identification types comprise determining to identify a variable denoting a person generically [Claim 16], wherein selecting identification types comprise determining to identify a variable denoting an object by using a label [Claim 17], wherein selecting identification types comprise determining to identify a variable denoting an object by using a description of the object [Claim 18]. However, Applicant has not disclosed that having proper names, generic names, labels and descriptions for persons or objects solves any stated problem or is for any particular purpose. Moreover, it appears that the variables of Sweitzer or the Applicant's instant invention would perform equally well for selecting identification types. Accordingly, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have modified the variable id's of Sweitzer, in combination with Bloom and Wen such that proper names, generic names, labels and descriptions for persons or objects identified variables, because such a modification would have been considered a mere design consideration, which fails to patentably distinguish over Sweitzer, Bloom, and Wen.

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**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nikolai A. Gishnock whose telephone number is 571-272-1420. The examiner can normally be reached on M-F 8:30a-5p.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert E. Pezzuto can be reached on 571-272-6996. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

*NAG*

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6/5/2007

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